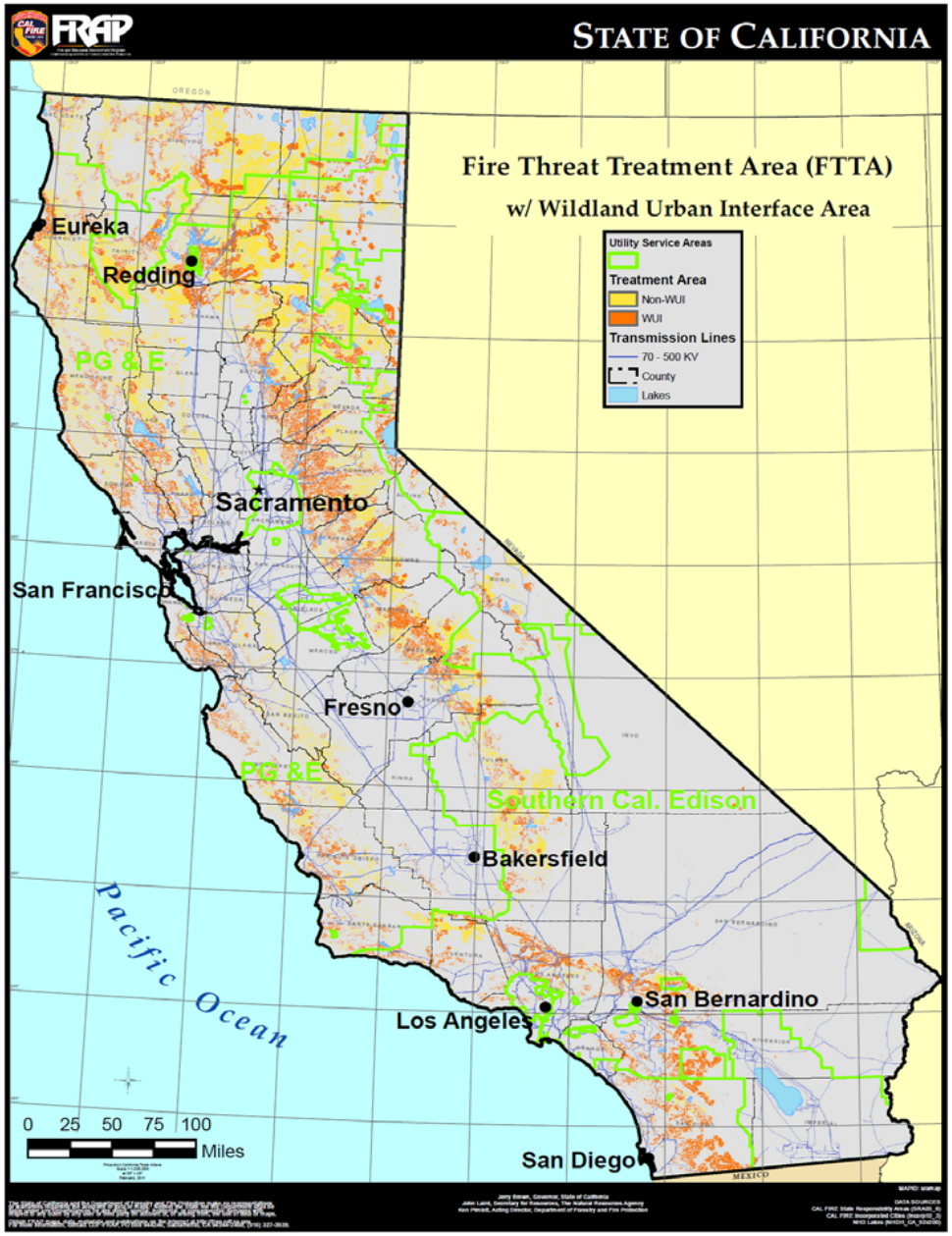
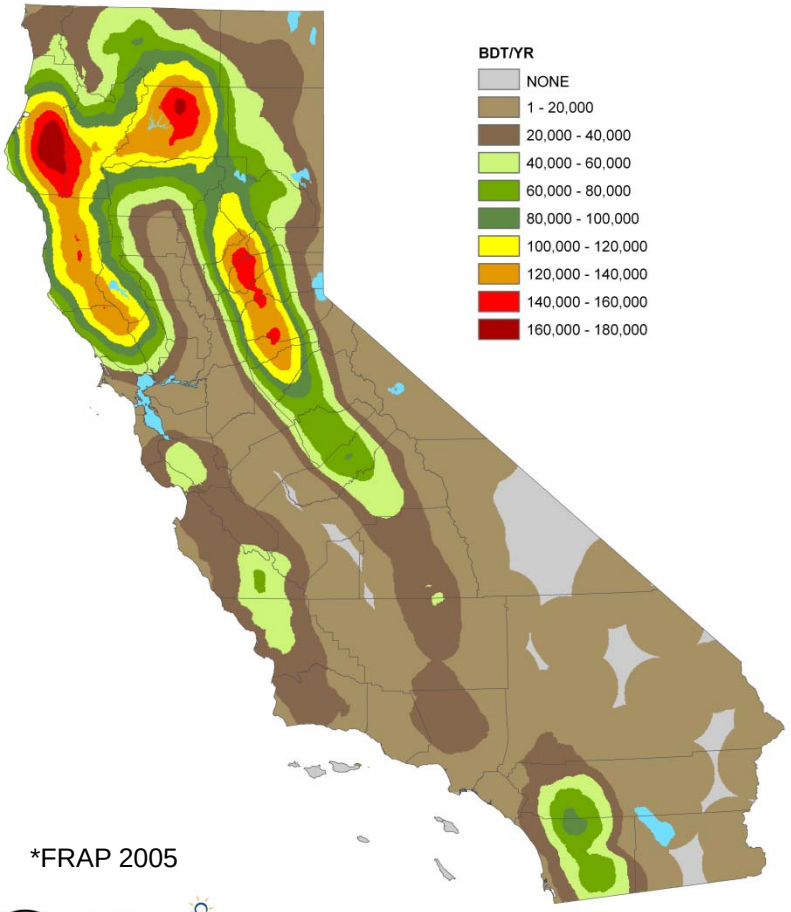

FRAP
STATE OF CALIFORNIA
Wildfire Threat to Ecosystems
w/ Electrical Transmission System Highlighted
Priority Landscape
High
Medium
Low
Transmission Lines
70 - 500 KV
Utility Service Areas
Lakes
County
Eureka
Redding
PG & E
Sacramento
San Francisco
Fresno
PG &E
Southern Cal. Edison
Bakersfield
Pacific Ocean
San Bernardino
Los Angeles
SDG&E
San Diego
0 25 50 75 100
Miles
Jerry Brown, Governor, State of California
John Laird, Secretary for Resources, The Natural Resources Agency
Ken Pimlott, Acting Director, Department of Forestry and Fire Protection


FRAP
STATE OF CALIFORNIA
Fire Threat Treatment Area (FTTA)
w/ Wildland Urban Interface Area
Utility Service Areas
Treatment Area
Non-WUI
WUI
Transmission Lines
70 - 500 KV
County
Lakes
OREGON
Eureka
Redding
PG & E
Sacramento
San Francisco
Fresno
PG & E
Southern Cal. Edison
Bakersfield
Pacific Ocean
San Bernardino
Los Angeles
San Diego
MEXICO
0 25 50 75 100
Miles

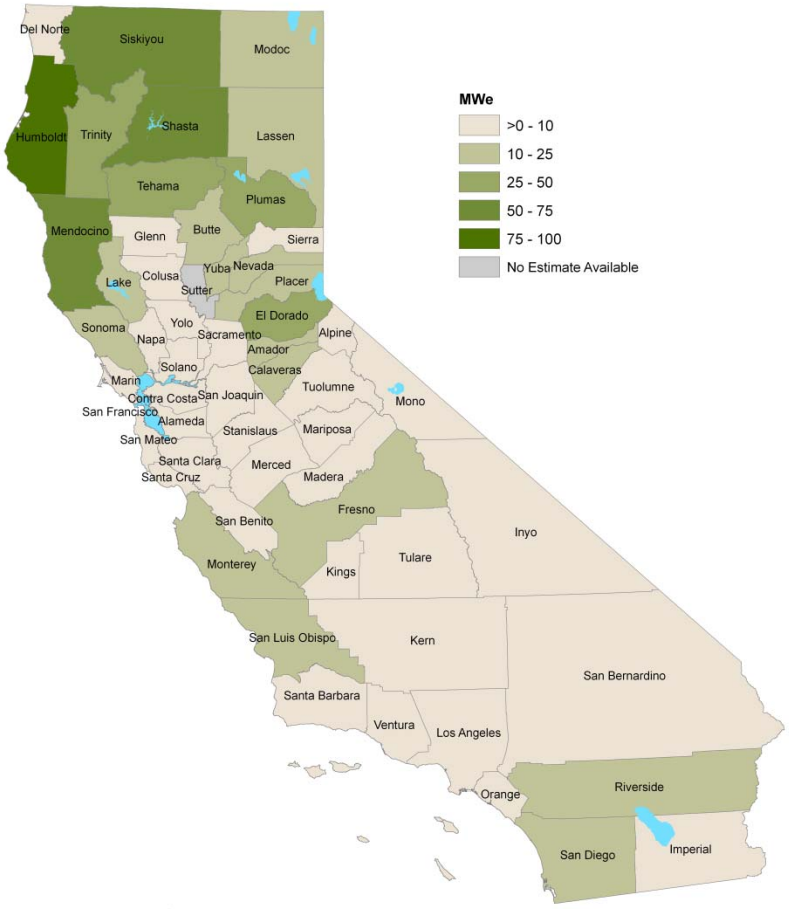
Estimated Annual Biomass Potential from Fire Threat reduction and Average Timber Harvest Volume in California*

Yellow and Red areas represent greater than 100,000 BDT/y within the 25 mile search window



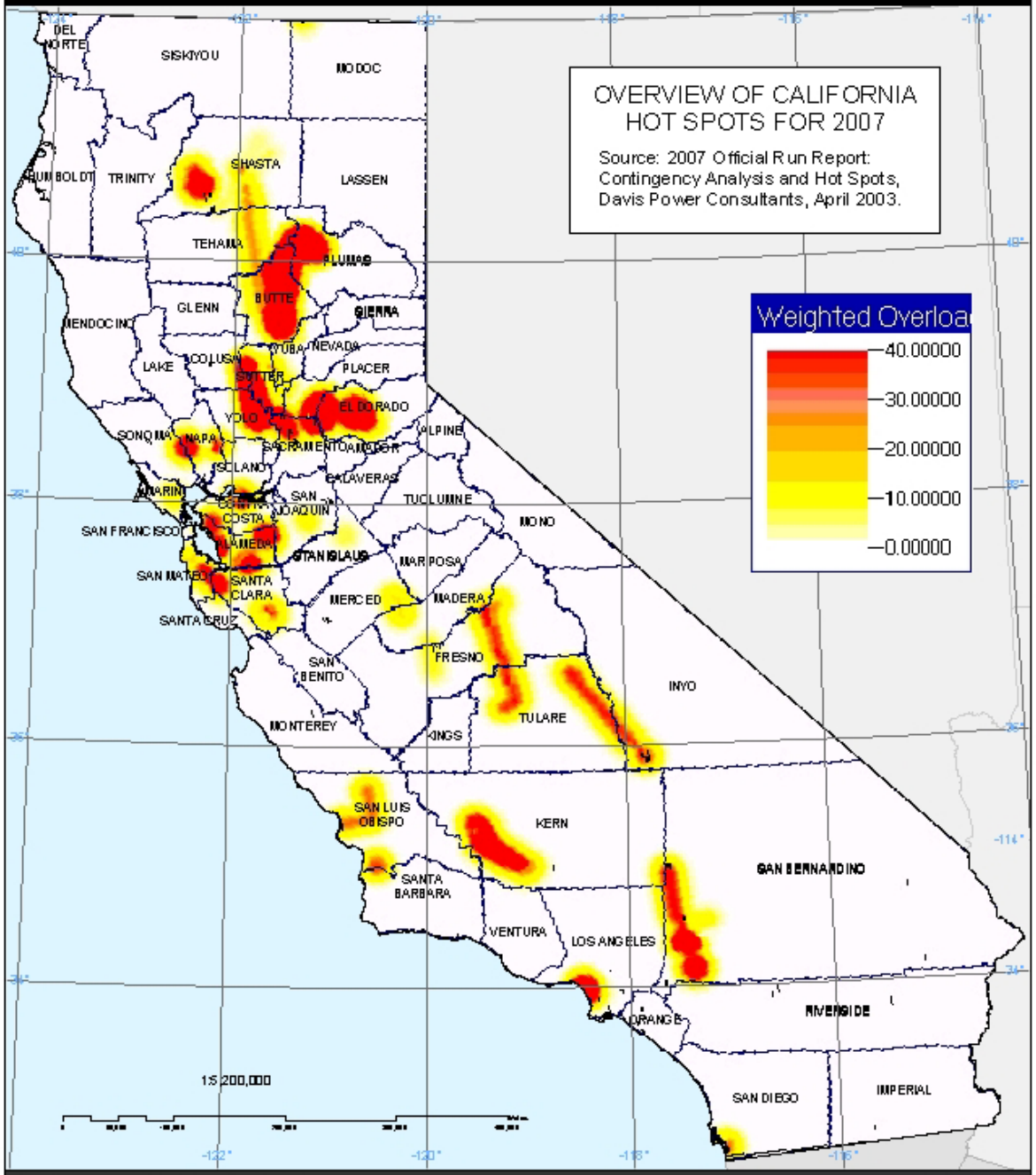
*FRAP 2005

Annual Electrical Capacity (MWe) of slash and thinning from Fire Threat Treatment Area and average annual Harvest (1999-2003)



FRAP

State of California



May 10, 2012

CEC Workshop on Identifying and Prioritizing Geographic Area for Renewable Energy Development

Talking points for Bill Snyder

- CAL FIRE has direct responsibility for fire prevention and suppression on 31 million acres in California and regulates commercial timber harvesting on 9 million acres of privately owned timberland in the state.
- PRC Sections 4799.14 thru 4799.16 authorizes the Department to support energy production utilizing woody biomass.
- The Department's interest in biomass and utilization of forest based woody biomass involves more than generation of energy and heat. Public benefits are significant and include:
    - Improved air quality through reduced fire emissions
    - Reduced net carbon emissions through reduced use of fossil fuels.
    - Community Safety
    - Healthier and more resilient forests and ecosystems.
    - Social benefits to urban and rural communities
- Markets for forest based woody biomass will provide direct benefits to forest health and reduction of fire threat to communities and ecosystems.
- Statewide there are 21 million acres of priority landscapes for preventing wildfire threats to maintain ecosystem health. (PPT slide 1)
- Each of these acres would benefit from treatments to reduce fire threat through removal of fuels that contribute to wildfire threat levels.
- The energy contained in these forest based fuels can contribute significant amounts of energy when utilized by a biomass plant.
- Locational considerations and benefits from forest based woody biomass energy generation are many:

- First, there are significant resources available-FRAP estimates that annual biomass opportunities can contribute 4.2 million BDT/yr in identified Fire Threat Treatment Areas. (PPT Slide 2)
- Second, this 4.2 million BDT/yr equates to a sustainable level of 753 MWe and 5.6 MWh/yr (Biomass Potentials from California Forests and Shrublands Including Fuel Reduction Potentials to Lessen Fires, CEC 2005).

- Placement of distributed biomass facilities of less than 3 MW can reduce costs of delivered fuels and cost of energy.
- Locationally distributed forest based woody biomass has significant advantages
  - First, the areas of concentration of woody biomass supplies correlate well with transmission infrastructure and should be preferred sites for permitting.
  - Second, areas of concentration of woody biomass correlate well with facility locations that will contribute to economic development and rural community jobs and should be preferred sites for economic development. (PPT Slide 3)
  - Third, areas of woody biomass concentration correlate well with facility locations near transmission hot spots which will have avoided costs accrue to the benefit of ratepayers and should be preferred sites for interconnection. (PPT slide 4)
  - Finally, development of markets for forest based woody biomass will have significant benefits for forest health and fire threat reduction and are preferred sites for accruing a significant set of public benefit and ecosystem values. Morris(1999 estimated these values to range from $0.067 to $0.14/KWh depending on fuel source with in-forest residue use showing a value of $0.078/kWh.
- Included for your reference is a brief compilation of data sets, information and resources that currently exist that are useful in identifying preferred geographic areas for location of distributed energy biomass plants.

- Also included for your reference are copies of the maps provided in the hearing as Power Point slides.
- In conclusion, it is our view that there is a considerable body of data and information to support locational advantages of distributed biomass.

Forest based Woody Biomass Data Sets & Reports

Data Sets –

- USDA – Forest Inventory and Analysis (FIA; provides an inventory of above ground biomass based on a nationwide grid of permanent forest inventory plots. This is the basic source of biomass information relied upon by all others.); http://www.fia.fs.fed.us/
- California Department of Forestry and Fire Protection – Fire and Resource Assessment Program (FRAP). Uses FIA data and filters data through various GIS layers to provide spatial and temporal analysis. - http://frap.cdf.ca.gov/
- California Biomass Collaborative; Uses FIA data and filters this data through various GIS layers to provide spatial analysis; http://biomass.ucdavis.edu/
- Department of Energy; BIOMASS AS FEEDSTOCK FOR A BIOENERGY AND BIOPRODUCTS INDUSTRY: THE TECHNICAL FEASIBILITY OF A BILLION-TON ANNUAL SUPPLY; 2005; http://www1.eere.energy.gov/biomass/pdfs/final_billionton_vision_report2.pdf

Tools – There are some tools developed to provide analysis for placement of bio-energy facilities.

- FIA BioSum – a tool used provide cost estimates and opportunities for the development of biomass based energy products. http://www.treesearch.fs.fed.us/pubs/20341

Reports –

- An Assessment of Biomass Resources in California, 2007; March 2008; CEC publication CEC- 500-01-016, http://biomass.ucdavis.edu/files/reports/2008-cbc-resource-assessment.pdf
- Biomass Potentials from California Forest and Shrub lands Including Fuel Reduction Potentials to Lessen Wildfire Threat, 2005, CEC 500-04-004 http://www.fire.ca.gov/resource_mgt/resource_mgt_EPRP_biomass_resources.php
- Jointly Optimizing Selection of Fuel Treatments and Siting of Forest Biomass-Based Energy Production Facilities for Landscape-Scale Fire Hazard Reduction; Daugherty and Fried, 2007; INFOR, Vol. 45, No. 1, February 2007, pp. 17-30 http://www.fs.fed.us/pnw/pubs/journals/pnw_2007_daugherty001.pdf
- A Strategic Assessment of Forest Biomass and Fuel Reduction Treatments in Western States, USDA March, 2005, RMRS-GTR- 149, http://www.fs.fed.us/rm/pubs/rmrs_gtr149.html
- California's Forest and Rangelands: 2010 Assessment; June 2010; California Department of Forestry and Fire Protection, Fire and Resource Assessment Program. http://frap.fire.ca.gov/assessment2010.html
- Distributed Generation and Cogeneration Policy Roadmap for California; March 2007; CEC publication CEC-500-2007-021, http://www.energy.ca.gov
- G. Morris, November 1999; The Value of the Benefits of U.S. Biomass Power; National Renewable Energy Laboratory, NREL/SR-570-27541, http://www.doe.gov/bridge
- Biomass Management Zones and New Pathways to Bioenergy; January 2012, CEC Publication CEC 500-2011-017, http://www.energy.ca.gov

- United State Forest Service Pacific Southwest Research Station; 2009, Biomass to Energy: Forest Management for Wildfire Reduction, Energy Production and Other Benefits. California Energy Commission publication CEC-500-2009-080. http://www.energy.ca.gov/2009publications/CEC-500-2009-080/index.html

Data Needs – To continue to develop information for the identification of geographic areas where biomass based renewable energy is cost effective and sustainable additional investment will be needed. To provide the basic data needed for analysis of forest biomass there will need to be continued investment in the USDA Forest Inventory and Analysis program. To improve the data available for California there is a need to increase the number of FIA plots established in state. The cost of each additional plot is in the range of $2-3,500 each.

Work needs to be continued on the development of models similar to Bio-Sum or those GIS application used by Cal-Fire/FRAP. Data alone is only of value for high level inventories without the application of spatial and temporal analysis.

The final identification of viable geographic areas for establishment of renewable energy facilities will necessarily be based on local knowledge. Though inventories can provide the amount of gross biomass available (MSW, AG, and Forest), there will need to be local interviews to determine how much of the gross biomass is already committed to other uses or products. Accurate estimation of production costs of material will also require local knowledge of transportation routes, harvesting equipment production rates, land reserves, and other limiting factors.